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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/972,995	SHIOMI ET AL.	
	Examiner	Art Unit	
	Daniel M. Pasiewicz	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-69* is/are pending in the application.

4a) Of the above claim(s) *3-8,17-25,33-41,46,48-50,53,58-61 and 65* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,9-16,26-32,42-45,47,51,52,54-57,59,62-64 and 66-69* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/28/02,3/15/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *IDS 12/16/03,2/19/04,7/28/04*.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of the election of species in the reply filed on 10/21/2005 is acknowledged. The traversal is on the ground(s) that "the public at large should not be required to obtain and study separate patent documents in order to have available all of the issued patent claims covering the invention." This is not found persuasive because applicant's traversal merely provides the applicant's opinion that the election of species is invalid without providing any evidence to support the opinion.

2. As stated in the Office Action dated September 21, 2005 "applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case." Since the applicant did not provide evidence to support the traversal the requirement is still deemed proper and is therefore made FINAL.

3. Claims 5, 18-24, 34-40, 48, 50 and 65 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species I, comprising Fig. 1-6, there being no allowable generic or linking claim (see explanation below). Applicant timely traversed the restriction (election) requirement in the reply filed on 10/21/2005.

- **Claim 5** depends from claim 4 which is a non-elected claim.
- **Claims 18 and 34** state "emitting light to an area, which crosses over said plurality of image sensing area, while screening incoming light into said plurality

of image sensing sections". However Species I (Fig. 1-6) is drawn towards the emitted light being reflected off of the front blades 14a of the shutter unit 14 (page 20 lines 16-25 of the specification). For this to occur the shutter must be closed as indicated in Fig. 2, thus the incoming light is screen from the image sensing sections. Therefore, the incoming light can not be screened into the image sensing section as stated by claims 18 and 34.

- **Claims 19-24 and 35-40** depend from claims 18 and 34 respectively which have been withdrawn for reasons indicated above.
- **Claim 48 and 65 state**, "a second setting unit for setting correction parameters on the basis of electric signals outputted from said plurality of image sensing sections with the optical path being opened by said shutter." Elected Species I (Fig. 1-6) is drawn towards setting correction parameters on the basis of electric signals outputted from the plurality of image sensing sections with the optical path closed by the shutter, since the emitted light which is used to generate the signals used for setting the correction parameters is reflected off of the shutter onto the image sensor (page 20 lines 16-25 of the specification).
- **Claim 50** depends from claim 48 which has been withdrawn for reasons indicated above.

Information Disclosure Statement

4. The information disclosure statement filed Dec 16, 2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all

other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

5. The IDS filed on Dec 16, 2003 contains Japanese References 7-038812 and 7-33814. The English abstract was provided for the indicated reference; however, the incorrect Japanese patent was supplied for each reference. The indicated references were not considered by the examiner.

Drawings

6. Figure 17 and 18 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. **The drawings are objected to because in Fig. 6 the outputs of Average Calculating Circuit 130 and 131 are connected to the same left-most group of arrows which connect to the input of Divider 134 and Subtracter 136. The output of Average Calculating Circuit 131 should be connected to the middle group of arrows, which connect to the input of Dividers 134 and 135 and Subtracters 136 and 137.** Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

9. The disclosure is objected to because of the following informalities: Reference to an incorrect figure.

- Page 32 line 15 states, "Fig. 7" when it is actually referencing Fig. 5.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 2, 9-14, 26-30, 42-44, 47, 51-52, 54-56, 59, 63-64 and 66-69 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,791,608 to Miyazawa.

11. With respect to **claim 1** Miyazawa discloses, in Fig. 1, 2 and 4, an image sensing apparatus (column 3 lines 59-61; where the image sensing apparatus is the digital camera) comprising: an image sensing device (103) having an image sensing area (103') which is divided into a plurality of image sensing sections (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) and generates electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), and a plurality of output units respectively outputting the electric signals of said plurality of image sensing sections (column 3 lines 65-67; where a plurality of output circuits are inherent to a CCD as each column has an output circuit in a shift register for outputting pixel signals from the CCD); a shutter (201) which can open and close an optical path of incoming light to said image

sensing device (103) (column 5 lines 16-18 and 27-29); and a light source (104) which emits light to at least a part of said image sensing area (103') of said image sensing device (103) so that the light is projected onto said plurality of image sensing sections (column 5 lines 16-21; where the shutter 201 is closed and the backlight 104 is allowed to light which projects light onto the image sensing area 103' containing the plurality of image sensing sections).

12. With respect to **claim 2** Miyazawa discloses, in Fig. 1, the image sensing apparatus according to claim 1, wherein said light source (104) is arranged near said shutter (201) and near a division boundary of said image sensing section of said image sensing device (103) (Fig. 1; where the backlight 104 can be seen near shutter 201 and a division boundary of said image sensing section comprising the top edge of the CCD 103 in Fig. 1).

13. With respect to **claim 9** Miyazawa discloses, in Fig. 4, the image sensing apparatus according to claim 1, further comprising a determination unit (110) that determines correlation of electric signals outputted by said plurality of output units (column 5 line 26 through column 6 line 4; where the correlation of the image captured with the emitted light while the shutter is closed is found with respect to the previously factory-stored position of picture element defects to determine if dirt is present on the surface of the CCD 103, the location of the dirt found through correlation is then stored in the dirt position storing memory in S29 for later use in image correction as seen in Fig. 5).

14. With respect to **claim 10** Miyazawa discloses, in Fig. 2 and 4, the image sensing apparatus according to claim 9, further comprising a controller (110) that controls said shutter (201) so that the optical path of incoming light to said image sensing device (103) is in a screened state (column 4 lines 24-27 and column 5 lines 16-18), and controls said light source (104) to emit light in the screened state (column 5 line 20).

15. With respect to **claim 11** Miyazawa discloses, in Fig. 2 and 5, the image sensing apparatus according to claim 10, further comprising a plurality of processors (113, 114, 115, 116 and 117) which respectively process the electric signals output from said plurality of output units of said image sensing device (column 4 lines 8-17 and column 6 lines 14-37; where the signals output from the CCD 103 are processed by processors 113-117 by converting the signals to digital signals, then correcting the signal due to CCD defects or dirt on the CCD 103 as indicated in Fig. 5), wherein said determination unit (110) determines correlation between the electric signals in a predetermined image area using outputs from said processor (column 5 lines 52-57; where the determination unit 110 determines correlation for the predetermined image area corresponding to all the picture elements of the CCD 103).

16. With respect to **claim 12** Miyazawa discloses, in Fig. 5, the image sensing apparatus according to claim 9, further comprising a correction unit (115) to correct the electric signals on the basis of the correlation (column 6 lines 14-37; where the electric signals from the CCD 103 are corrected using the data from the dirt position storing memory 117 which is derived from the correlation as stated above).

17. With respect to **claim 13** Miyazawa discloses, in Fig. 5, the image sensing apparatus according to claim 12, further comprising a combining unit which combines electric signals of the plurality of image sensing sections corrected by said correction unit (110) (column 6 lines 39-47; where it is checked if all the picture elements have been read out, once all the picture elements are read out they are combined to one image file for processing such as compression).

18. With respect to **claim 14** Miyazawa discloses, Fig. 5, the image sensing apparatus according to claim 12, wherein the electric signals are corrected using the correlation (column 6 lines 32-38; where the data of the location of the dirt generated from the correlation is used to correct the electric signals by providing a location of pixels to be interpolated from the surrounding pixels).

19. With respect to **claim 26** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a control method for an image sensing apparatus that comprises an image sensing device (103) having an image sensing area (103') which is divided into a plurality of image sensing sections (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) and generates electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113) and a plurality of output units respectively outputting the electric signals of said plurality of image sensing sections (column 3 lines 65-67; where a plurality of output circuits are inherent to a CCD as each column has an output circuit in a shift register for outputting

pixel signals from the CCD), a shutter (201) which can open and close an optical path of incoming light to said image sensing device (103) (column 5 lines 16-18 and 27-29), and a light source (104) which emits light to at least a part of said image sensing area (103') of said image sensing device (103) so that the light is projected onto said plurality of image sensing sections (column 5 lines 16-21; where the shutter 201 is closed and the backlight 104 is allowed to light which projects light onto the image sensing area 103' containing the plurality of image sensing sections), comprising: a screening step (S21) of screening an optical path of incoming light by the shutter (201) (column 5 lines 16-18); a light emitting step (S22) of emitting light by the light source (104) with the optical path screened (column 5 line 20); and a determining step (S28) of determining correlation between electric signals that are obtained by emitting light in said light emitting step and are outputted by the plurality of output units (column 5 line 26 through column 6 line 4; where the correlation of the image captured with the emitted light while the shutter is closed is found with respect to the previously factory-stored position of picture element defects to determine if dirt is present on the surface of the CCD 103, the location of the dirt found through correlation is then stored in the dirt position storing memory in S29 for later use in image correction as seen in Fig. 5).

20. With respect to **claim 27** Miyazawa discloses, in Fig. 2 and 5, the method according to claim 26, further comprising a processing step of separately processing the electric signals output from said plurality of output units of said image sensing device (column 6 lines 14-37; where the signals output from the CCD 103 are processed by converting the signals to digital signals, then correcting the signal due to CCD defects or

dirt on the CCD 103 as indicated in Fig. 5), wherein, in said determination step (S28), correlation between the electric signals in a predetermined image area is determined using outputs obtained in said processing step (column 5 lines 52-57; where the determination unit 110 determines correlation for the predetermined image area corresponding to all the picture elements of the CCD 103 and the electric signals come from outputs used in the processing step comprising the A/D converter 113).

21. With respect to **claim 28** Miyazawa discloses, in Fig. 5, the method according to claim 26, further comprising a correcting step of correcting the electric signals based on the correlation (column 6 lines 14-37; where the electric signals from the CCD 103 are corrected using the data from the dirt position storing memory 117 which is derived from the correlation as stated above).

22. With respect to **claim 29** Miyazawa discloses, in Fig. 5, the method according to claim 28, further comprising a combining step of combining the electric signals of the plurality of image sensing sections that are corrected at the correcting step (column 6 lines 39-47; where it is checked if all the picture elements have been read out, once all the picture elements are read out they are combined to one image file for processing such as compression).

23. With respect to **claim 30** Miyazawa discloses, Fig. 5, the method according to claim 28, wherein the electric signals are corrected using the correlation (column 6 lines 32-38; where the data of the location of the dirt generated from the correlation is used to correct the electric signals by providing a location of pixels to be interpolated from the surrounding pixels).

24. With respect to **claim 42** Miyazawa discloses, in Fig. 1, 2, 4 and 5, an image sensing apparatus (column 3 lines 59-61; where the image sensing apparatus is the digital camera) comprising: an image sensing device (103) having an image sensing area (103') which is divided into a plurality of image sensing sections each of which has a plurality of pixels (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) that generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), and a plurality of output units respectively outputting the electric signals of said plurality of image sensing sections (column 3 lines 65-67; where a plurality of output circuits are inherent to a CCD as each column has an output circuit in a shift register for outputting pixel signals from the CCD); a shutter (201) which can open and close an optical path of incoming light to said image sensing device (103) (column 5 lines 16-18 and 27-29); and a correction unit (115) to correct difference in levels between the electric signals obtained from said plurality of image sensing sections with the optical path being opened by said shutter (201) on the basis of the electronic signals outputted from said plurality of image sensing sections with screening the optical path by said shutter (201) (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5,

to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

25. With respect to **claim 43** Miyazawa discloses, in Fig. 1 and 4, the image sensing apparatus according to claim 42, further comprising a light source (104) for emitting light to at least a part of said image sensing area (103') of said image sensing device (103) so that the light is projected onto said plurality of image sensing sections (column 5 lines 16-21; where the shutter 201 is closed and the backlight 104 is allowed to light which projects light onto the image sensing area 103' containing the plurality of image sensing sections), wherein said correction unit (115) to correct difference in levels between the electric signals obtained from said plurality of image sensing sections with the optical path being opened by said shutter (201) on the basis of the electronic signals outputted from said plurality of image sensing sections while light is emitted by said light source (104) with screening the optical path by said shutter (201) (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value

the pixel at the location should have through interpolation of surrounding pixels in steps S45).

26. With respect to **claim 44** Miyazawa discloses, in Fig. 5, the image sensing apparatus according to claim 42, wherein said correction unit has a first setting unit for setting correction parameters on the basis of electric signals outputted from said plurality of image sensing sections while screening the optical path by said shutter (201) (column 6 lines 32-38; where the correction parameters are used in the interpolation for replacing the dirt pixel value and are derived from the 8 surrounding pixels; these are based from the electric signals outputted from said plurality of image sensing sections while screening the optical path by said shutter 201 since the interpolation is done on pixels determined to be dirty pixel as disclosed above).

27. With respect to **claim 47** Miyazawa discloses, in Fig. 5, the image sensing apparatus according to claim 42, wherein said correction unit (115) performs correction on the basis of electronic signals outputted from said plurality of image sensing sections with the optical path being opened by said shutter (201) and signals outputted form said plurality of images sensing sections while screening the optical path by said shutter (201) (column 6 lines 14-38; where the correction is done using signals from when the image sensing section 103 is screened by using the locations of dirt derived from said signals as correction locations and the correction is done on the basis of signals outputted when the optical path is open since the 8 surrounding pixels are used to corrected the pixel at the location of the dirty pixel).

28. With respect to **claim 51** Miyazawa discloses, in Fig. 2 and 4, the image sensing apparatus according to claim 42, further comprising a switch that automatically switches a main image sensing mode in which an image of an object is recorded by opening the optical path by said shutter (201), and a pre-image sensing mode in which image sensing is performed while screening the optical path by said shutter (201) (column 4 lines 24-27 and column 5 lines 27-29; where the CPU 110 controls the shutter and is the switch; once the data is stored in memory of the image used for dirt detection in the pre-image sensing mode (S23) the back light is turned off (S24) and the shutter 201 is automatically opened (S25) switching the camera to main image sensing mode).

29. With respect to **claim 52** Miyazawa discloses, in Fig. 1, 2, 4 and 5, an image sensing apparatus (column 3 lines 59-61; where the image sensing apparatus is the digital camera) comprising: an image sensing area (103') having a plurality of pixels that generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where CCD 103 has a surface 103' and it is inherent to CCD 103 to have a plurality of pixels; the CCD 103 takes the image entering the camera and converts it to electric signals corresponding to incident light to the surface of the CCD 103' which are digitized by the A/D converter 113); a shutter (201) that can open and close an optical path of incoming light to said image sensing area (103') (column 5 lines 16-18 and 27-29); a light source (104) for emitting light to at least a part of said image sensing area (103') (column 5 lines 16-21; where the shutter 201 is closed and the backlight 104 is allowed to light which projects light onto the image sensing area 103'); and a correction unit (115) to correct an electric signals obtained

from said image sensing area with the optical path being opened by said shutter (201) on the basis of an electronic signal outputted from said image sensing area while light is emitted by said light source (104) with screening the optical path by said shutter (201) (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

30. With respect to **claim 54** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a correction method for correcting difference of levels between electric signals outputted from an image sensing device (see below) that has an image sensing area (301') divided into a plurality of image sensing sections each of which has a plurality of pixels (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) that generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), and outputs the electric signals from said plurality of image sensing sections (column 6 lines 14-18; where the CCD 103 outputs the signals to A/D converter 113), comprising: a correction

step (S45) of correcting difference in levels between the electric signals obtained from said plurality of image sensing sections with the optical path being opened to said image sensing sections on the basis of the electronic signals outputted from said plurality of image sensing sections with screening the optical path to the image sensing sections (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; where the shutter 201 opens and closes the optical path to the image sensing sections; and electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

31. With respect to **claim 55** Miyazawa discloses, in Fig. 5, the correction method according to claim 54, wherein at said correction step (S45), difference in levels between the electric signals obtained from said plurality of image sensing sections with the optical path being opened is corrected on the basis of the electronic signals outputted from said plurality of image sensing sections while light is projected on at least a part of image sensing area (301') of the image sensing device (301) so that the light is projected onto the plurality of image sensing sections with screening the optical path to the image sensing sections (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; where the shutter 201 opens and closes the optical path to the image

sensing sections; and electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

32. With respect to **claim 56** Miyazawa discloses, in Fig. 5, the correction method according to claim 54, wherein said correction step (S45) has a first setting step for setting correction parameters on the basis of electric signals outputted from the plurality of image sensing sections with screening the optical path (column 6 lines 32-38; where the correction parameters are used in the interpolation for replacing the dirt pixel value and are derived from the 8 surrounding pixels; these are based from the electric signals outputted from said plurality of image sensing sections while screening the optical path by said shutter 201 since the interpolation is done on pixels determined to be dirty pixel as disclosed above).

33. With respect to **claim 59** Miyazawa discloses, in Fig. 5, the correction method according to claim 54, wherein, at the correction step (S45), correction is performed on the basis of electronic signals outputted from said plurality of image sensing sections with the optical path being opened to the image sensing sections and signals outputted form said plurality of images sensing sections with screening the optical path to the image sensing section (column 6 lines 14-38; where the correction is done using signals

from when the image sensing section 103 is screened by using the locations of dirt derived from said signals as correction locations and the correction is done on the basis of signals outputted when the optical path is open since the 8 surrounding pixels are used to corrected the pixel at the location of the dirty pixel).

34. With respect to **claim 63** Miyazawa discloses, in Fig. 2 and 4, the correction method according to claim 54, further comprising a switching step of automatically switches a main image sensing mode in which an image of an object is recorded by opening the optical path, and a pre-image sensing mode in which image sensing is performed while screening the optical path (column 4 lines 24-27 and column 5 lines 27-29; where the CPU 110 controls the shutter and is the switch; once the data is stored in memory of the image used for dirt detection in the pre-image sensing mode (S23) the back light is turned off (S24) and the shutter 201 is automatically opened (S25) switching the camera to main image sensing mode).

35. With respect to **claim 64** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a correction method for correcting electric signals outputted from an image sensing area (301') which is divided into a plurality of image sensing sections each of which has a plurality of pixels (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) which generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), and outputs the electric signals from said plurality of image sensing sections (column 6

lines 14-18; where the CCD 103 outputs the signals to A/D converter 113), comprising: a correction step (S45) of correcting electric signals obtained from the image sensing sections with an optical path being opened to said image sensing sections on the basis of the electronic signals outputted from the image sensing sections with screening the optical path to the image sensing sections and emitting light to at least a part of the image sensing sections (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; where the shutter 201 opens and closes the optical path to the image sensing sections; and electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

36. With respect to **claim 66** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a computer program product comprising a computer usable medium having computer readable program code means embodied in said medium (column 4 lines 30-32; where the CPU 110 controls the system through use of a computer program) for controlling an image sensing apparatus (column 3 lines 59-61; where the image sensing apparatus is the digital camera) comprising: an image sensing device (103) having an image sensing area (103') which is divided into a plurality of image sensing sections (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing

sections which comprises columns containing rows of pixels) and generates electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113) and a plurality of output units respectively outputting the electric signals of said plurality of image sensing sections (column 3 lines 65-67; where a plurality of output circuits are inherent to a CCD as each column has an output circuit in a shift register for outputting pixel signals from the CCD), a shutter (201) which can open and close an optical path of incoming light to said image sensing device (103) (column 5 lines 16-18 and 27-29), and a light source (104) which emits light to at least a part of said image sensing area (103') of said image sensing device (103) so that the light is projected onto said plurality of image sensing sections (column 5 lines 16-21; where the shutter 201 is closed and the backlight 104 is allowed to light which projects light onto the image sensing area 103' containing the plurality of image sensing sections), said product including: first computer readable program code means for screening an optical path of incoming light by the shutter (201) (column 5 lines 16-18); second computer readable program code means for emitting light by the light source (104) with the optical path screened (column 5 line 20); and third computer readable program code means for determining correlation between electric signals that are obtained by emitting light and are outputted by the plurality of output units (column 5 line 26 through column 6 line 4; where the correlation of the image captured with the emitted light while the shutter is closed is found with respect to the previously factory-stored position of picture element defects to determine if dirt is

present on the surface of the CCD 103, the location of the dirt found through correlation is then stored in the dirt position storing memory in S29 for later use in image correction as seen in Fig. 5).

37. With respect to **claim 67** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a computer program product comprising a computer usable medium having computer readable program code means embodied in said medium (column 4 lines 30-32; where the CPU 110 controls the system through use of a computer program) for processing signals obtained from an image sensing device (103) having an image sensing area (103') which is divided into a plurality of image sensing sections (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) and generates electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113) and a plurality of output units respectively outputting the electric signals of said plurality of image sensing sections (column 3 lines 65-67; where a plurality of output circuits are inherent to a CCD as each column has an output circuit in a shift register for outputting pixel signals from the CCD), said product including: computer readable program code means for determining correlation between electric signals that are obtained by emitting light to an area, which crosses over the plurality of divided sections and is at least part of the image sensing area while screening incoming light into the image sensing sections (column 5 lines 16-20; where the backlight 104 is turned on providing light to the entire CCD 103 for dust

location correction), and that are outputted by the plurality of output units (column 5 line 26 through column 6 line 4; where the correlation of the image captured with the emitted light while the shutter is closed is found with respect to the previously factory-stored position of picture element defects to determine if dirt is present on the surface of the CCD 103, the location of the dirt found through correlation is then stored in the dirt position storing memory in S29 for later use in image correction as seen in Fig. 5).

38. With respect to **claim 68** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a computer program product comprising a computer usable medium having computer readable program code means embodied in said medium (column 4 lines 30-32; where the CPU 110 controls the system through use of a computer program) for correcting difference of levels between electric signals outputted from an image sensing device (see below) that has an image sensing area (301') divided into a plurality of image sensing sections each of which has a plurality of pixels (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) that generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), and outputs the electric signals from said plurality of image sensing sections (column 6 lines 14-18; where the CCD 103 outputs the signals to A/D converter 113), said product including: computer readable program code means for correcting difference in levels between the electric signals obtained from the plurality of image sensing sections with the optical path being opened to said image sensing

sections on the basis of the electronic signals outputted from the plurality of image sensing sections with screening the optical path to the image sensing sections (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; where the shutter 201 opens and closes the optical path to the image sensing sections; and electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

39. With respect to **claim 69** Miyazawa discloses, in Fig. 1, 2, 4 and 5, a computer program product comprising a computer usable medium having computer readable program code means embodied in said medium (column 4 lines 30-32; where the CPU 110 controls the system through use of a computer program) for correcting electric signals outputted from an image sensing area (301') which is divided into a plurality of image sensing sections having a plurality of pixels (column 3 lines 65-67; where an image sensor is inherently divided into a plurality of image sensing sections which comprises columns containing rows of pixels) which generate electric signals corresponding to amounts of incident light (column 3 lines 65-67 and column 6 lines 14-18; where the CCD 103 takes the image entering the camera and converts it to electric signals which are digitized by the A/D converter 113), said product including: computer

readable program code means for correcting electric signals obtained from the image sensing sections with an optical path being opened to the image sensing sections on the basis of the electronic signals outputted from the image sensing sections with screening the optical path to the image sensing sections and emitting light to at least a part of the image sensing sections (column 4 lines 8-17 and column 5 line 12 through column 6 line 38; where the shutter 201 opens and closes the optical path to the image sensing sections; and electronic signals are taken while the shutter is closed and backlight 104 is turned on, these signals are used to determine if dirt is present on the surface of the CCD 103; locations of the found dirt are then stored in memory 117 to be used, as seen in Fig. 5, to correct the difference of a signal level obtained by the CCD 103 with the shutter open for normal photographing at a location of a pixel which corresponds to the location of dirt on the CCD 103 and the actual value the pixel at the location should have through interpolation of surrounding pixels in steps S45).

Claim Rejections - 35 USC § 103

40. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

41. Claims 15, 16, 31, 32, 45, 57 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,791,608 to Miyazawa.

42. With respect to **claims 15, 16, 31 and 32** Miyazawa discloses an image sensing apparatus and a method for controlling said apparatus comprising: an image sensing device divided into a plurality of image sensing sections; a shutter which can open and close an optical path of incoming light to said image sensing device; a light source which emits light to the image sensing device and a determination unit that determines correlation of electric signals outputted by the image sensing device.

43. Miyazawa also discloses that the electric signals are correlated by means comprising comparing the electric signals to a threshold and also with a position of picture element defect which is previously factory-stored in the picture element defect position storing memory. Miyazawa does not expressly disclose details of the comparisons or thresholds used in the correlation or where the correlation is a ratio between the electric signals or a difference between the electric signals.

44. However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of using ratios and differences in comparison of image values to thresholds are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have the correlation of the dirty pixel data disclosed by Miyazawa be a ratio or a difference, for doing so would allow the use of captured data and use of mathematical formulas to derive thresholds, storage locations, pixel values, etc accurately and depending upon acquired data instead of predefined values which are used for every correlation regardless of the data acquired for correlation, thus providing the optimum correlation for every acquired data with must be correlated.

45. With respect to **claims 45, 57 and 62** Miyazawa discloses an image sensing apparatus and correction method comprising: an image sensing apparatus and a method for controlling said apparatus comprising: an image sensing device divided into a plurality of image sensing sections; a shutter which can open and close an optical path of incoming light to said image sensing device; a correction unit to correct difference in levels between the electric signals obtained with the optical path open on the basis of electric signals obtained with the optical path screened and setting parameters for correction based on electric signals outputted while screening the optical path.

46. Miyazawa also discloses that the correction of the pixels corresponding to dirt locations are corrected using parameters for interpolation from the pixels surrounding the pixel needing correction (column 6 lines 32-38). Miyazawa does not expressly disclose details of the parameters used for the interpolation or that these parameters are at least either of offset values and gain values that are to be applied to electric signals outputted from said plurality of image sensing sections.

47. However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of using either offset or gain values of surrounding pixels that are applied to a pixel to be correct through interpolation are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to use offset values or gain values of surrounding pixels in the interpolation disclosed by Miyazawa for doing so would provide a more accurate corrected pixel value by

adding weighted gain or offset values to the corrected pixel value based upon values of surrounding pixels.

Conclusion

48. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent 5,515,102 to Pearsall et al which discloses an image sensor which has a portion of the sensor illuminated by a light source and future images are correct through use of the image taken with the light source illuminated.
- U.S. Patent 6,608,648 to Bean which discloses an image apparatus which has a light reflected onto the image sensor with the optical path screened.
- U.S. Patent 6,072,603 to Parks which discloses an image sensor divided into a plurality of image areas which contain a plurality of pixels, the output images are then correlated and combined into a single image.
- U.S. Patent 6,337,713 to Sato which discloses an image sensor divided into a plurality of image areas which contain a plurality of pixels, the output images are then correlated and combined into a single image

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel M. Pasiewicz whose telephone number is (571)272-5516. The examiner can normally be reached on M-F 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on (571)272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP
January 6, 2006

NGOC-YEN VU
PRIMARY EXAMINER